

What is claimed is:

1. A method for use in a stored program controlled system comprising a plurality of processing units and a signal generator for interconnecting processing units using wavelength division multiplexing over a free space beam line, said method
5 including the steps of:

generating a message at one of said plurality of processing units for a destination processing unit comprising another one of said plurality of processing units;

10 modulating the message on a specific optical wavelength;
transmitting the modulated message over said free space beam line;
receiving said modulated message at a wavelength selective receiver;
selecting a particular wavelength at said receiver; and
recreating the message and forwarding it to said destination processing unit.

2. A method in accordance with claim 1 wherein said signal generator includes
15 a tunable laser, said step of modulating comprising:

tuning said tunable laser to said specific optical wavelength prior to modulating the message on said specific optical wavelength.

3. A method in accordance with claim 1 wherein said signal generator includes a plurality of fixed wavelength lasers, each of which operates on a different
20 wavelength, said step of modulating comprising:

delivering said message to one of said plurality of fixed wavelength lasers corresponding to said specific optical wavelength prior to modulating the message on said specific optical wavelength.

4. A method in accordance with claim 1 wherein said wavelength selective
25 receiver comprises tunable photodetectors, said step of selecting comprising:
tuning said tunable photodetector to said specific optical wavelength.

5. A method in accordance with claim 1 wherein said wavelength selective receiver comprises one of a plurality of fixed wavelength photodetectors, all operating at different wavelengths, said step of selecting comprising:
30 receiving only the fixed wavelength.

6. A method in accordance with claim 1 wherein said wavelength selective receiver comprises one of a plurality of fixed wavelength photodetectors and a tunable photodetector, said method further including the step of:

5 dynamically allocating bandwidth by receiving messages on a primary wavelength at said one of a plurality of fixed wavelength photodetectors and receiving one or more messages on other wavelengths at said tunable photodetector.

7. A method in accordance with claim 1 wherein each of said processing units includes a fixed transmitter comprising a laser configured to modulate on a fixed optical wavelength over said free space optical beam line and a tunable transmitter
10 comprising a tunable laser configured to modulate on multiple, selectable wavelengths, said method further including the step of:

dynamically allocating bandwidth by transmitting messages on a primary wavelength at said fixed wavelength transmitter and transmitting one or more messages on other wavelengths at said tunable transmitter.

15 8. A system for use in a stored program controlled system comprising a plurality of processing units for interconnecting said processing units using wavelength division multiplexing over a free space optical beam line, said system comprising:

20 a transmitter configured to generate a message at one of said plurality of processing units for a destination processing unit comprising another one of said plurality of processing units;

a laser configured to modulate the message on a specific optical wavelength over said free space optical beam line;

a wavelength selective receiver; and

25 means at said receiver for recreating the message and forwarding it to said destination processing unit.

9. A system in accordance with claim 8 wherein said laser comprises a tunable laser configured to modulate at a specific optical wavelength before transmitting said message.

30 10. A system in accordance with claim 8 wherein said laser comprises a fixed wavelength laser.

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11. A system in accordance with claim 8 wherein said wavelength selective receiver comprises a tunable photodetector.

12. A system in accordance with claim 8 wherein said wavelength selective receiver comprises a fixed wavelength photodetector.

5 13. A system in accordance with claim 8 wherein said wavelength selective receiver comprises a fixed wavelength photodetector and a tunable photodetector configured to dynamically allocating bandwidth by receiving messages on a primary wavelength at said one of a plurality of fixed wavelength photodetectors and receiving one or more messages on other wavelengths at said tunable photodetector.

10 14. A system in accordance with claim 8 further including means for dynamic wavelength allocation and deallocation responsive to system load.